



US Army Corps
of Engineers ®

EIRS Bulletin

Engineering Improvement Recommendation System

No. 97-03

Date: 31 March 1997

The Engineering Improvement Recommendation System Bulletin is part of our Information Feedback System and is used in military construction programs to expedite dissemination of information regarding problems. The probable solutions included in the EIRS BULLETIN have not been thoroughly explored or staffed. Accordingly, these probable solutions do not represent a final HQUSACE position, and their use is not mandatory. Probable solutions are considered as informational in nature for the purpose of permitting prompt consideration by the field. EIRS Bulletin recipients are encouraged to comment on the probable solutions presented so that other viewpoints can be considered in the development of the final HQUSACE position. Since changes to criteria approved by ENG Form 3078, Recommended Changes to Engineering Documents, are expected to remain firm, they are identified as final solutions and should be used in current design. To defray printing costs, local reproduction of this bulletin is authorized. This issue of the EIRS Bulletin contains 5 enclosures as follows:

ENCL 1: ENGINEERING AND DESIGN - Year 2000 Compliant Equipment

ENCL 2: ENGINEERING AND DESIGN - Barracks Upgrade Program Seismic Upgrade and Value Engineering Criteria

ENCL 3: ENGINEERING AND DESIGN - Proper Handling of Refrigerants

ENCL 4: RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS - ENG Form 3078 Follow-up Actions

ENCL 5: ENGINEERING AND DESIGN - CURRENT DESIGN CRITERIA - Recently Issued Criteria

FOR THE COMMANDER:

5 Encls


KISUK CHEUNG
Chief, Engineering Division
Directorate of Military Programs

ENGINEERING AND DESIGN

Year 2000 Compliant Equipment:

a. **Problem:** Many computer based systems, equipment containing microprocessors, and supporting software use a two digit date designation, such as 97 for the year 1997. In the year 2000, any computer based system that uses the two digit date designation, will report the date as 1900.

b. **Probable Solution:** Require that all microprocessor based equipment and software be Year 2000 compliant. The FAR definition of Year 2000 compliance is: "Year 2000 compliant means information technology that accurately processes date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, including leap year calculations. Furthermore, Year 2000 compliant information technology, when used in combination with other information technology, shall accurately process date/time data if the other information technology properly exchanges date/time data with it."

(1) Leap year calculations are important because of the complexity of the leap year rule, which is: "If the year is divisible by 4, it is a leap year, UNLESS the year is also divisible by 100, then it's not a leap year, UNLESS the year is also divisible by 400, then it is a leap year." What this means is that 1900 was not a leap year, but the year 2000 will be.

(2) This requirement applies to any micro-processor controlled equipment and software, such as intrusion detection systems, utility monitoring and control systems, elevator controls, HVAC controls, computers, etc., that perform any type of date/time processing.

(3) The following statement, which can be edited as required, should be included in all microprocessor based specifications where the hardware or software will be required to process date/time calculations: "This equipment shall be Year 2000 compliant and shall be able to accurately process date/time data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, including leap year calculations, when used in accordance with the product documentation provided by the contractor, provided that

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all products (e.g. hardware, software, firmware) used in combination with other information technology, shall accurately process date/time data if the other information technology properly exchanges date/time data with it."

c. Implementation: The implementation of this policy is considered to have immediate application as defined by ER 1110-345-100.

ENGINEERING AND DESIGN

Barracks Upgrade Program Seismic Upgrade and Value Engineering Criteria:

a. **Problem:** Recently issued seismic and Value Engineering criteria in the Architectural and Engineering Instructions (AEI) for Barracks Upgrade Program (BUP), implemented 27 February 1997, needs to be clarified.

b. **Probable Solution:** Architectural and Engineering Instructions, Barracks Upgrade Program, 27 February 1997, chapter 2, paragraphs 3.c. Value Engineering and 6.c. Structure, should be revised as follows:

"c. **Value Engineering (VE).** The OACSIM has consented to VE studies of the generic designs for the two standard barracks types (LBC&W and BB&A), for FY 97. The Center for Design Development (Ft. Worth District) will send copies of the generic design VE studies to the design-district. The design-district Value Engineering Officers (VEO) will be included as part of the design teams to ensure the proper inclusion of accepted items in individual projects (and savings shown accordingly). The VEO should attend design conferences with the installation as appropriate, and participate in other portions of the process as appropriate to ensure maximum possible acceptance of proposals and no FY 97 schedule delays. Project funds will be utilized for this activity in FY 97. The design-district Value Engineering Officers will conduct Value Engineering Reviews beginning in FY 98 (not a full VE study) to ensure that the maximum amount of generic study proposals offered are incorporated and to offer any changes due to lessons learned in FY 97. Further, beginning in FY 98, VE for projects based on non-standard designs will be performed as stated in Corps policy. The user(s) shall be invited to participate in the Value Engineering Review along with any needed technical support for analysis. Construction Value Engineering Change Proposals (VECP) shall be coordinated with the Center for Design Development to ensure compliance with HQ and OACSIM wishes.

c. **Structural.**

(1) Seismic Safety Rehabilitation Guidance.

(a) Under the Army's Seismic Risk Mitigation Program (SRMP), the Seismic Technical Center of Expertise (STCX) in the North Pacific Division is currently screening and evaluating the Army's buildings throughout the country. Prior to doing barracks evaluation under BUP, the STCX shall be contacted to determine the status of the screening and evaluation. If the barracks in question have already been evaluated under the SRMP, reports

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describing their ability to survive a seismic event will be furnished. The geographic district will use the results of this evaluation to perform preliminary design and cost estimate for the seismic upgrade. If the barracks have not been evaluated, the STCX will give the scheduled time for their evaluation. If the scheduled evaluation is not timely to suit the BUP schedule, the barracks upgrade shall proceed without the seismic upgrade provisions. If the building has been found to be seismically deficient under an independent evaluation by the district or the installation, the geographic district will use these results to perform preliminary design and cost estimate for the seismic upgrade. In any event, before a solicitation is issued for any barracks with a seismic upgrade, OACSIM must be notified of the incremental cost of the seismic upgrade to determine if the upgrade is affordable within the BUP fiscal constraints. If the seismic upgrade is determined to be unaffordable, OACSIM will delete the barracks in question from the BUP, and the disposition of the barracks will be determined.

(b) The results of SRMP, to date, indicate that the LBC&W barrack types meet the requirements for Zones 1 and 2A with no structural upgrade. The LBC&W barrack types do not meet the requirements for Zones 2B and 3 and will require structural modification. Seattle District has performed a structural evaluation for Fort Lewis barracks (LBC&W) and prepared a design for structural modification. The Fort Lewis design shall be used for the LBC&W barrack types in Zones 2B and 3. The BB&A barracks satisfies the requirements in Zones 1 and 2A, where all barracks of this type are located, and require no structural work.

(c) The demand capacity and level which this seismic upgrade rehabilitation must achieve is found in the Federal Emergency Management Agency (FEMA) documents *FEMA 273, NEHRP Guidelines for the Seismic Rehabilitation of Buildings* and *FEMA 274, NEHRP Commentary on the Guidelines for the Seismic Rehabilitation of Buildings*. Any questions concerning seismic evaluation, rehabilitation design, or seismic criteria can be directed to Ray Decker in STCX, 503-326-6877. Policy questions shall be directed to Ray Navidi or Charles Gutberlet, HQUSACE (CEMP-ET), (202) 761-0223.

(2) Roofs.

(a) Roof diaphragms and connections will be investigated, particularly connections to the frames or shear walls.

(b) If Standing Seam Metal Roof Systems (SSMRS) are used, the structural design of the roof system and its interaction with the building must be evaluated. It is doubtful that the SSMRS would impose structural loading on the building that would be beyond the building's capacity. However, because the SSMRS adds considerably to the height of the building, a structural evaluation of lateral load is advisable.

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(c) There is a moratorium on the use of cold formed steel load bearing members. Supports for the roof SSMRS or any other loadbearing structural element may not incorporate cold formed steel members."

c. Implementation: The implementation of this policy is considered to have **immediate application** as defined by ER 1110-345-100.

d. Additional Information: For additional information concerning BUP criteria contact Mr. Stanley J. Swofford, R.A., CEMP-EA, telephone (202) 761-0441 or DSN 763-0441, telecopier (202) 761-8815, email stanley.swofford@inet.hq.usace.army.mil. For additional clarification of the BUP seismic issue described above please contact Mr. Ray Navidi, P.E., CEMP-ET, telephone (202) 761-0223 or DSN 763-0223, telecopier (202) 761-4139, email ray.navidi@inet.hq.usace.army.mil.

ENGINEERING AND DESIGN

Proper Handling of Refrigerants:

a. Problem: The current Corps guide specifications addressing refrigerants are incomplete and inconsistent. In some specifications guidance is not given to all refrigerants that are commercially available today. There are also many stipulations from ASHRAE 15, Safety Code for Mechanical Refrigeration, associated with refrigerants in mechanical rooms which need to be included in the Corps guide specifications that are not mentioned. These specification inadequacies present a safety concern.

b. Probable Solution: It is important that paragraphs addressing refrigerants are consistent throughout the Corps guide specifications. The guide specifications containing refrigerant handling information include: CEGS-15650, Central Refrigerated Air-Conditioning System, CEGS-15652, Cold Storage Refrigeration Systems, CEGS-15653, Air Conditioning System (Unitary Type) and CEGS-15775, Field-Erected Heat Pump System. The health and safety reasons for refrigerant handling guidelines is the same no matter what type of refrigeration system is used.

(1) The three most commonly used refrigerants continue to be R-123, R-22 and R-134a. The designer should refer directly to ASHRAE 15 for further guidance when another refrigerant or azeotrope is used. When the design calls for a refrigeration system, the designer should determine the quantity of refrigerant that will be needed. The designer should look at a minimum of two different manufacturers for the tonnage of refrigeration machine required for their design and ascertain this refrigerant amount from catalog data.

(2) Having determined the kilograms (pounds) of refrigerant needed, find the occupied space for the cooling system. Next, take the grams of refrigerant per cubic meter (pounds of refrigerant per 1000 cubic feet) of occupied space and compare this figure to Table 1 of ASHRAE 15. A partial listing is given below:

Quantity of Refrigerant per Occupied Space

<u>Chemical Name</u>	<u>Gram per Cubic Meter</u>	<u>Lb per 1000 Cubic Ft</u>
R-22 Chlorodifluoromethane	150	9.4
R-134a 1, 1, 1, 2-Tetrafluoroethane	250	16
R-123 2, 2-Dichloro-1, 1, 1-Trifluoroethane	6.3	.40

If the quantity of refrigerant in a system exceeds those listed in Table 1, ASHRAE 15, systems greater than 64,168.2 kilocalories/hour (100 horsepower) (127.3 tons) apply the following. From paragraph 4 section 7.4.2, General System Application Requirements, "...all refrigerant containing parts, except for piping and those parts outside the building, shall be installed in a machinery room..."

(3) When a machine or mechanical room is required, refrigerant leak detectors or oxygen sensors, depending on the refrigerant used, will also be required. Depending on the guide specifications to be used delete paragraph 2.7.4, Refrigerant Leak Detector, from CEGS-15650, or paragraph 2.12, Refrigerant Leak Detector, from CEGS-15652 or paragraphs 2.17, Refrigerant Leak Detector and 2.18, Oxygen Sensor, from CEGS-15653 or paragraphs 2.6.1 and 2.6.2 with all associated notes from CEGS-15775 and replace with the following:

REFRIGERANT LEAK DETECTOR

The Contractor shall equip the mechanical room, which contains the refrigeration equipment, with a refrigerant leak detector if the equipment provided utilizes R-123. The refrigerant leak detector shall be a Halogen-Specific detector to sense refrigerant within the mechanical room. The detector shall be specifically designed for area monitoring, and have an adjustable sensitivity such that it can detect refrigerant at or above 3 ppm, and initiate an alarm actuated at a value not greater than 10 ppm and enable mechanical ventilation as per the mechanical room ventilation paragraph. The detector shall be located in the mechanical room where refrigerant from the equipment is likely to concentrate.

OXYGEN SENSOR

The Contractor shall equip the mechanical room, which contains the refrigeration equipment, with an oxygen sensor if the equipment provided utilizes R-22 or R-134a. The oxygen sensor shall initiate an alarm if oxygen levels in the mechanical room drop below 19.5 volume percent. The sensor shall be specifically designed to measure the percent oxygen level within an area. The sensor shall have an adjustable sensitivity such that it can alarm if the oxygen level is 21 volume percent and below and initiate an alarm actuated at a value not greater than 10 ppm and enable mechanical ventilation as per the mechanical room ventilation paragraph. The sensor shall be located in an area of the mechanical room containing the equipment where refrigerant from a leak is likely to concentrate.

If the refrigeration system is less than 64,168.2 kilocalories/hour (100 horsepower) (127.3 tons) but has a refrigerant concentration greater than that of Table 1, ASHRAE 15, the need for a separate machine or mechanical room with positive ventilation in accordance with paragraph 8.13.5, ASHRAE 15 can be eliminated if all of the following are met.

- a. Occupancies containing machinery are separated from other occupancies by tight construction and with tight-fitting doors
- b. Access by authorized personnel is controlled
- c. Personnel density and means of egress are in compliance with local building codes
- d. Leak detectors are provided as stated above
- e. No flame-producing device or hot surface above 800 degree Fahrenheit shall be permitted.

This EIRS bulletin provides interim guidance for the designer until a thorough implementation of ASHRAE 15 in the Corps guide specifications is incorporated. These instructions provide guidance on machine room requirements for refrigeration equipment and the type of leak detection and alarm systems to be used. Additionally, machine room ventilation requirements are already included in the four guide specifications previously listed. When the designer has determined a machine room is necessary he/she should refer directly to the latest version of ASHRAE 15. The Huntsville Support Center is currently working on implementing the rules of the standard into all pertinent guide specifications.

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS

ENG Form 3078 Follow-up Actions:

a. Problem: ENG Forms 3078 which indicate an affirmative action by HQUSACE are provided to the originating USACE Commands. Since the ENG Forms 3078 will result in changes to the criteria and guidance, all USACE Commands should receive the same information to be used in criteria designs.

b. Probable Solution: Reviewed ENG Forms 3078 which make a commitment to change guide specifications, manuals, etc. will be included in the EIRS Bulletin, unless the change has been accomplished. This enclosure includes a copy of ENG Form 3078.

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ENG FORMS 3078

<u>CONTROL NO.</u>	<u>PUB NO.</u>	<u>OFFICE SYMBOL</u>
9066	CEGS-02685	CESWF-ED-TM
9068	CEGS-08330	CEMRO-ED-DC
	CEGS-08300	
	CEGS-08365	

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Submit a separate form in quadruplicate for each report) (ER 1110-345-100)		OFFICE SYMBOL AND DATE CESWF-ED-TM CESWF-ED-CS 18 Dec 96
DOCUMENT NUMBER AND DATE CEGS-02685 (Dec 93) W/Not #3 (Sep 95)	DOCUMENT TITLE Gas Distribution System	
DOCUMENT TYPE <input type="checkbox"/> DRAWING (STANDARD) (DEFINITIVE) <input checked="" type="checkbox"/> SPECIFICATION (GUIDE) (STANDARD) <input type="checkbox"/> DESIGN GUIDES <input type="checkbox"/> TECHNICAL MANUAL <input type="checkbox"/> ENGINEER MANUAL <input type="checkbox"/> ENGINEER REGULATION <input type="checkbox"/> OTHER		<input checked="" type="checkbox"/> MILITARY <input type="checkbox"/> CIVIL WORKS
SUBJECT Gas Distribution System, Various paragraphs		
ROUTING (Check)		
FROM: District Commander U.S. Army Engineer District, ATTN: CESWF-ED-CS Fort Worth, TX 76102-0300		
ACTION RECOMMENDED BY DISTRICT COMMANDER (See Sheet 2)		
OFFICE SYMBOL CESWF-ED		NAME AND TITLE (Print or Type) R. TERRY COOMES, P.E. Chief, Engineering Division
DATE 18 Dec 96		SIGNATURE <i>[Signature]</i>
1a. TO: HQUSACE (CEMP-EA) WASH DC 20314-1000		
INFORMATION COPY OF THIS ENG FORM 3076 WAS SENT _____ (Date)		
1b. TO: Division Commander U.S. Army Engineer Division, ATTN: CESWD-ED-T Dallas, TX 75242-0216		
COMMENTS, ACTION, OR RECOMMENDATION BY DIVISION COMMANDER Concur - recommend approval. <i>[Signature]</i>		
OFFICE SYMBOL CESWD-ET		NAME AND TITLE (Print or Type) PAUL D. ROBINSON, P.E. Director, Engineering and Tech Services Directorate
DATE 9 Jan 97		SIGNATURE <i>[Signature]</i>
2. TO: HQUSACE (CEMP-EA) WASH DC 20314-1000		
COMMENTS OR ACTION BY COMMANDER, USACE Concur. Specification will be revised.		
OFFICE SYMBOL CEMP-E		NAME AND TITLE (Print or Type) KISUK CHEUNG, P.E. C, ENGR. DIV.
DATE 27 Feb 97		SIGNATURE <i>[Signature]</i>
3. TO: Division Commander U.S. Army Engineer Division, ATTN: CESWD-ED-T Dallas, TX 75242-0216		
COMMENTS BY DIVISION COMMANDER		
OFFICE SYMBOL		NAME AND TITLE (Print or Type)
DATE		SIGNATURE
4. RETURN TO: District Commander U.S. Army Engineer District, ATTN: CESWF-ED-CS Fort Worth, TX 76102-0300		
COPY FURNISHED		

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Cont'd)

OFFICE SYMBOL AND DATE
CESWF-ED-TM
CESWF-ED-CS
18 Dec 96

PROBLEM DISCRPTION AND ACTION RECOMMENDED (Use additional sheets if necessary.)

1. PROBLEM:

See Attached Sheet.

2. RECOMMENDED SOLUTION:

See Attached Sheet.

NAME OF SUBMITTER (Optional)

Jack Osborne

WORK TELEPHONE NUMBER (Optional)

,817, 978-2297

Sheet 3 of 3

CESWF-ED-TM

CESWF-ED-CS

18 Dec 96

SUBJECT: Gas Distribution System

1. **PROBLEM:** Paragraph 2.4 Meters, NOTE TO DESIGNER, indicates that strainers are not to be required unless the meter is installed upstream of the regulator. However, the body of the paragraph does not contain brackets to allow editing of the strainer requirement. Consequently many designers fail to remove the requirement for strainers.

1. **RECOMMENDED SOLUTION:** Add brackets in paragraph 2.4 so that second sentence reads: "Meters shall be [pipe] [pedestal] mounted {and be provided with a strainer immediately upstream}."

2. **PROBLEM:** Paragraph 2.4 Meters, does not contain brackets to allow removal of third sentence in its entirety. This sentence has bracketed requirements for over-pressure protection, tamper proof protection, frost protection, and fungus-proof protection. However, if none of these provisions are needed and are edited out, the remaining sentence is incomplete.

2. **RECOMMENDED SOLUTION:** Add brackets in paragraph 2.4 so that third sentence reads: "[Meters shall be provided with {over-pressure protection} {tamper proof protection} {frost protection} {fungus-proof protection}]."

3. **PROBLEM:** Paragraph 2.3.2 Service Line Regulators, has a mix of inconsistent metric pressure units. The third sentence, when edited for metric projects, calls out gas pressure in Pa of water column. The fifth sentence then calls for gas pressure in kPa. Finally, the sixth sentence calls for gas pressure in mm of water column.

3. **RECOMMENDED SOLUTION:** The paragraph should be rewritten using a single metric pressure unit (Pa or kPa). The words "water column" should only appear within brackets or parenthesis of English unit descriptions.

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Submit a separate form in quadruplicate for each report) (ER 1110-345-710, 720 and ER 1110-2-1200)		OFFICE SYMBOL AND DATE CEMRO-ED-DC 11 Dec 96
DOCUMENT NUMBER AND DATE CEGS 08330 (Feb 94) CEGS 08360 (Feb 94) CEGS 08365 (Sep 94)	DOCUMENT TITLE Overhead Rolling Doors Sectional Overhead Doors Vertical Lift Doors	
DOCUMENT TYPE <input type="checkbox"/> DRAWING ((STANDARD) (DEFINITIVE)) <input checked="" type="checkbox"/> SPECIFICATION ((GUIDE) (STANDARD)) <input type="checkbox"/> DESIGN GUIDES <input type="checkbox"/> ARCHITECT-ENGINEER INSTRUCTION MANUAL <input type="checkbox"/> ENGINEER MANUAL <input type="checkbox"/> ENGINEER REGULATION <input type="checkbox"/> OTHER		<input checked="" type="checkbox"/> MILITARY <input type="checkbox"/> CIVIL WORKS
SUBJECT ELECTRIC POWERED OPERATORS LOCATED IN HAZARDOUS AREAS.		
ROUTING (Check) FROM: CEMRO-ED District Commander U.S. Army Engineer District, 1612 USPO & Courthouse 215 N. 17th Street Omaha, NE 68102-4978 <i>JET</i>		
ACTION RECOMMENDED BY DISTRICT COMMANDER (See Sheet 2)		
OFFICE SYMBOL CEMRO-ED		NAME AND TITLE (Print or Type) <i>for</i> Robert F. Roumph, Chief, Engineering Division
DATE 16 Dec 96		SIGNATURE <i>Charles W. Sankert</i>
1a. TO: HQUSACE (CEEC-ES) WASH DC 20314-1000	INFORMATION COPY OF THIS ENG FORM 3078 WAS SENT 12-19-96 (Date)	
1b. TO: CEMRD-ET-E Division Commander U.S. Army Engineer Division, Missouri River Rx 0x 0x 0x 0x 0x 0x DTA Omaha x 0x 0x 0x 0x 0x 0x 0103 2565 W. Center Rd Omaha, NE 68144-3869	COMMENTS, ACTION, OR RECOMMENDATION BY DIVISION COMMANDER Recommend approval.	
	OFFICE SYMBOL CEMRD-ET	NAME AND TITLE (Print or Type) KRISTINE L. ALLAMAN, P.E. Director, Engrg & Tech Services
	DATE 9 Jan 97	SIGNATURE <i>Kristine L. Allaman</i>
2. TO: HQUSACE XXXXXX CEMP-RA WASH DC 20314-1000	COMMENTS OR ACTION BY CHIEF OF ENGINEERS CONCUR - See attached CEMP-EA Comments	
	OFFICE SYMBOL CEMP-E	NAME AND TITLE (Print or Type) KISUK CHEUNG, P.E. Chief, Engineering Division
	DATE 10 MAR 1997	SIGNATURE <i>Kisuk Cheung</i>
3. TO: CEMRD-ET-E Division Commander U.S. Army Engineer Division, Missouri River P. O. Box 103 DTS Omaha, NE 68101-0103	COMMENTS BY DIVISION COMMANDER <i>[Signature]</i>	
	OFFICE SYMBOL	NAME AND TITLE (Print or Type)
	DATE	SIGNATURE
4. RETURN TO: CEMRO-ED-DI District Commander U.S. Army Engineer District, 1612 USPO & Courthouse 215 N. 17th Street Omaha, NE 68102-4978	COPY FURNISHED	

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Cont'd)

OFFICE SYMBOL AND DATE

CEMRO-ED-DC
4 Dec 96

PROBLEM DISCUSSION AND ACTION RECOMMENDED (Use additional sheets if necessary.)

1 PROBLEM:

SEE ATTACHED.

2 RECOMMENDED SOLUTION:

SEE ATTACHED.

NAME OF SUBMITTER (Optional)

KEVIN TERNES, ELECTRICAL ENGINEER

WORK TELEPHONE NUMBER
(Optional)

(402) 221-4560

ENG Form 3078

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CEMRO-ED-DC
11 Dec 96

Document Number: CEGS-08330 Overhead Rolling Doors
CEGS-08360 Sectional Overhead Doors
CEGS-08365 Vertical Lift Doors

Subject: Electric Powered Operators Located in Hazardous Areas

1. PROBLEM:

During Missouri River Division's Quality Assurance inspection of construction projects, a deficiency was noted at the ADAL Wastewater Treatment Plant project at the U.S. Air Force Academy, Colorado Springs. The entire volume of the Headworks Building was classified as a Class I, Division 2, hazardous area. The motorized overhead door opener and controls installed in this facility did not meet the requirements for installation in a hazardous area. There has been an increasing number of deficiencies in this area.

The guide specifications need to be expanded because the COE is designing and building more Army and Air Force Base wastewater treatment facilities, EPA ground water treatment facilities and HTRW treatment facilities that use overhead doors. This would reduce the repetitive deficiency of specifying and installing nonhazardous door equipment in hazardous areas.

It appears the specification may have been written for facilities that have a hazardous area that does not extend to the top of the overhead door (e.g., vehicle maintenance facilities). In this instance, the motor does not need to be rated for a hazardous area because it will be installed above the hazardous area. Although the designer note has the following sentence: "The motor, limit switches, reversing starter, or some other component requiring enclosures greater than NEMA 1 should be exactly specified.", it appears that designers do not add necessary wording to the specification to make the equipment rated for hazardous areas.

2. RECOMMENDED SOLUTIONS:

Huntsville needs to research industry standards and rewrite the specifications via the criteria update process. Subject specifications should use all the same verbiage to specify the motor, controls, sensing edge devices and electrical work. The following are specific areas of concerns that need to be addressed in the update of the specification.

(a) Each of the specifications have a paragraph similarly titled, "Electric Power Operator with Auxiliary Chain Hoist Operation", with the following subparagraphs.

(1) The subparagraph titled, "Motors", should be edited to include a designer's choice to specify the appropriate motor starter enclosure rated for the appropriate hazardous (Class, Division and Group) or nonhazardous area. The motor enclosure shall also have designers choices to specify the appropriate

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type of enclosure (e.g., drip proof, TEFC, or explosion proof suitable for a Class __, Division __, Group __ hazardous area).

(2) The subparagraph titled, "Controls", implies that a NEMA 7 or 9 enclosure is required in hazardous areas. This is not necessarily true. A NEMA 12 enclosure can be used if hermetically sealed contacts or intrinsically safe relays are used. Several manufacturers use intrinsically safe relays in hazardous areas. Editing a listing of the NFPA 70 articles is not used in other guide specifications and should be changed in subject specifications to specify the Class, Division and Group of the hazardous area. This allows the requirements of the entire NFPA 70 to be referenced. The reference to "Section 50" of the NFPA 70 should be deleted because NFPA 70 is divided into chapters not sections.

(3) The subparagraph titled, "Sensing Edge Devices", shall have designers choices so that the electric sensing edge device can be specified to be rated for hazardous areas when appropriate.

(4) The subparagraph titled, "Electrical Work", should be edited to delete the listing of NFPA 70 articles so that the entire NFPA 70 is valid. The current list does not include article 505 and special occupancies of articles 511 through 517. Also, the automatic take up reel needs designer's choices so that it can be specifically rated for hazardous areas when appropriate.

(b) The need for static grounding of the door and door guides needs to be addressed. The door guide rollers may produce sparks that could cause an explosion in the hazardous area. The drive gears, etc., could also produce unwanted sparks.

(c) The need for a bronze chain or other nonmetallic device on the manual hoist needs to be addressed. The currently specified galvanized chain could produce sparks when it is swinging freely and making metal-to-metal contact.

CEMP-EA

4 March 1997

SUBJECT: Response to ENG Form 3078 on CEGS 08330, Overhead Rolling Doors;
CEGS 08360, Sectional Overhead Doors; and 08365, Vertical Lift Doors.
Case Number 9068.

1. ENG Form 3078 discusses problems related to the operating motors and controls when used in hazardous areas.
2. Subject CEGS are currently being revised. We concur with your ENG Form 3078 regarding motor, controls, sensing edge devices, and electrical work changes. Subject CEGS will be revised to provide appropriate alternatives for the specifications of these elements in hazardous areas. The preliminary drafts are currently being coordinated with industry. Revised CEGS will be issued this year.
3. Thank you for bringing this matter to our attention.

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CURRENT DESIGN CRITERIA

Recently Issued Criteria:

a. Problem: There have been instances where current design criteria were not used in project designs because recently issued Engineering and Design documents were placed in a central office file and were not distributed to design personnel who need to be aware of the current criteria and guidance.

b. Probable Solution: From all reports, EIRS Bulletins are widely circulated within the Engineering Division of USACE Commands and are readily accessible to all engineering and design personnel. This enclosure includes a listing of recently issued criteria.

Engineering and Design criteria for Civil Works and Military Programs are distributed by the "Construction Criteria Base (CCB)" System, National Institute of Building Sciences NIBS. CCB is available in CD-ROM format and is on the CCB web site at "<http://www.nibs.org/ccb>". Information about subscribing to CCB may be obtained by calling NIBS at (202) 289-7800. Current Military Programs Engineering and Design criteria are also available on our TECHINFO web site at "<http://w2.hnd.usace.army.mil>". For further information on TECHINFO, call the Huntsville Engineering and Support Center, CEHNC-ED-ES-G, at (205) 895-1821 between 8:00 a.m. and 4:00 p.m., Central Time.

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PUBLICATION LIST

<u>PUB-NO.</u>	<u>PUBLICATION</u>	<u>PUB-DATE</u>
CEGS-01410	Environment Protection	Feb 97
CEGS-01415	Metric Measurements	Mar 97
CEGS-10615	Demountable Partitions	Apr 97
AEI	Barracks Upgrade Program, Annex B	Feb 97